

Human Exploration Research Analog



HERA

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NASA/JSC

HERA configuration



Core and Loft

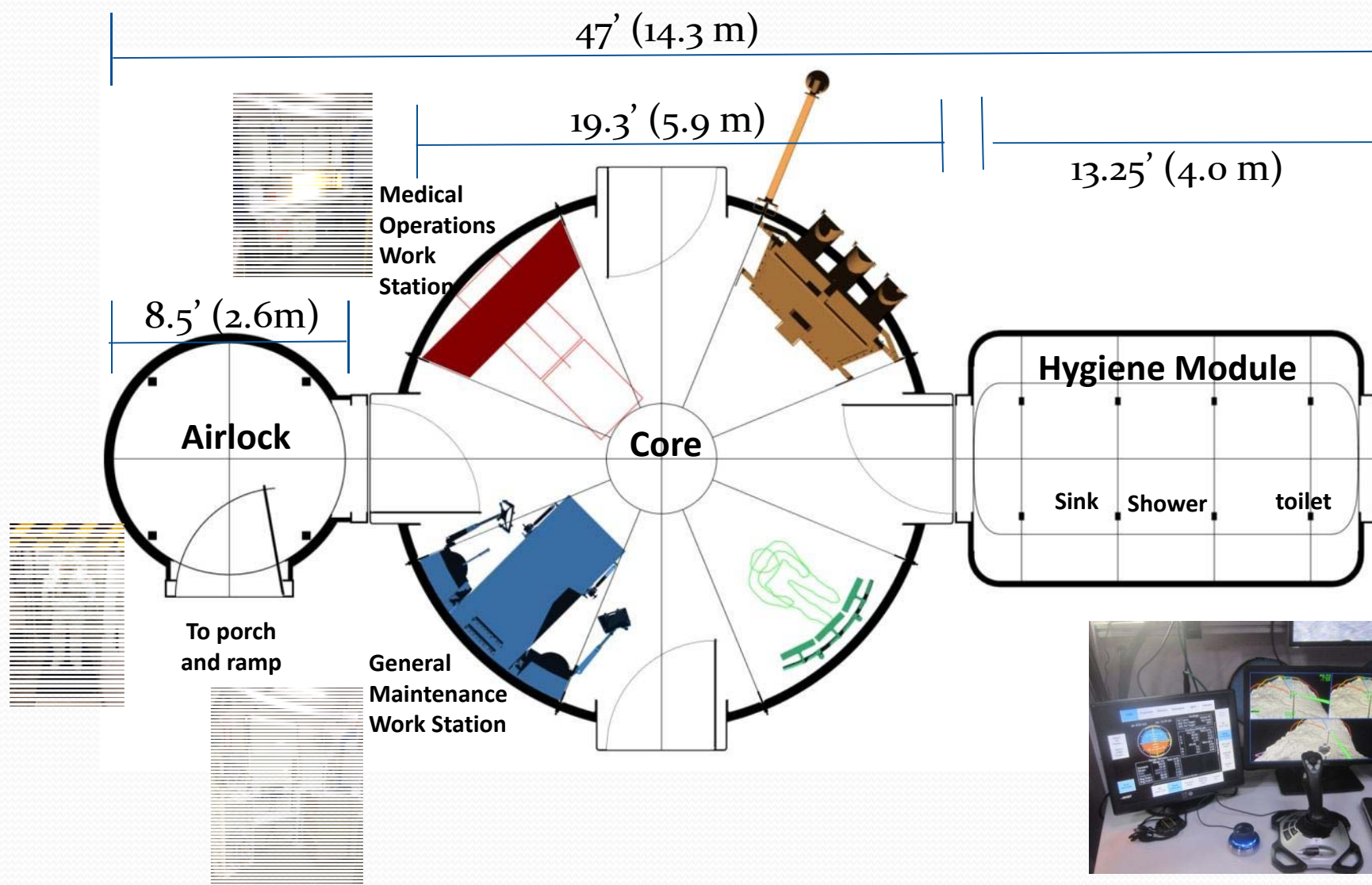


Airlock

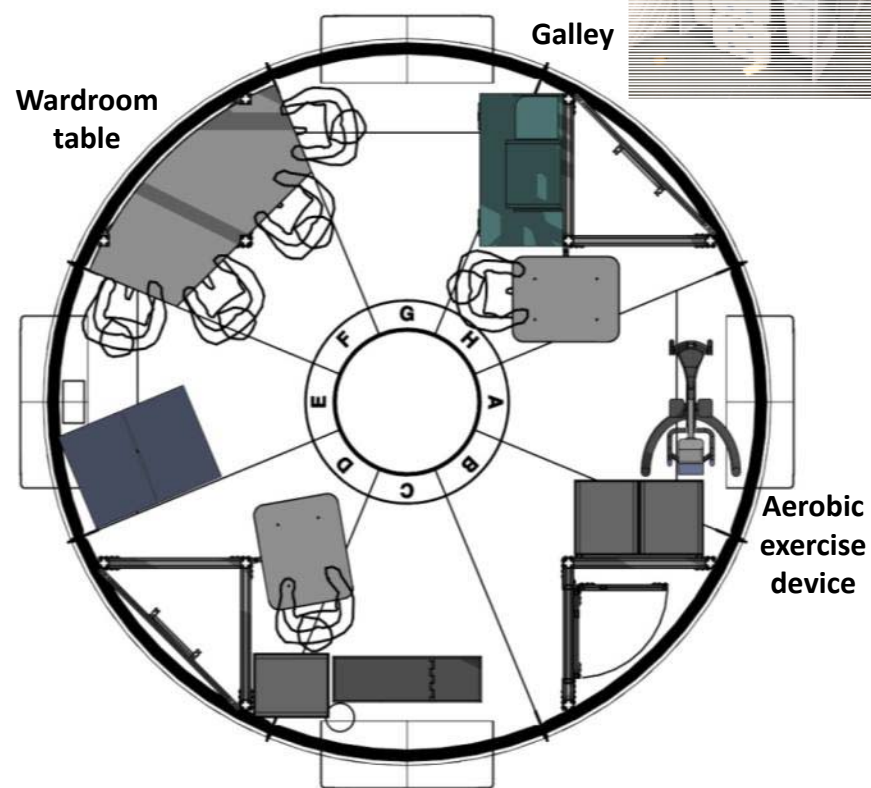
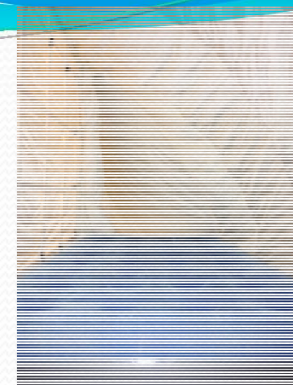
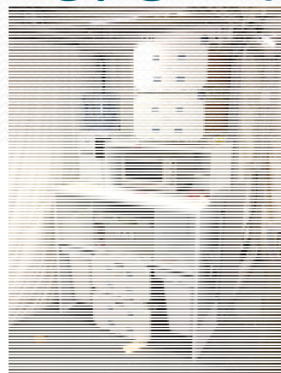
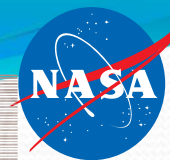
**Hygiene
Module**



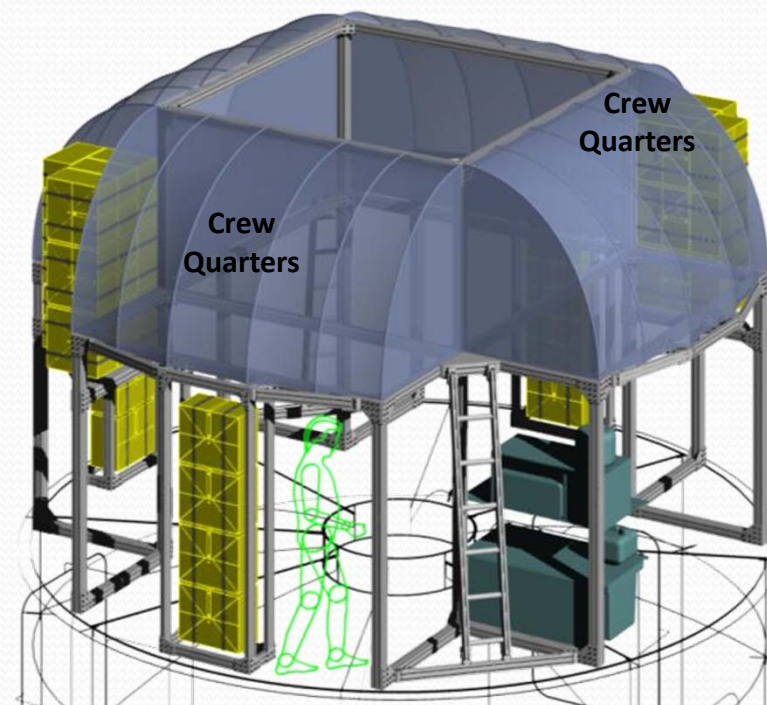
HERA interior (1st floor)



HERA interior (2nd & 3rd floors)



2nd floor



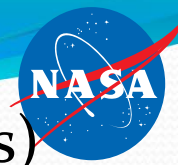
3rd floor

HERA volume and dimensions



- Core Module (Lab Deck): 56.0 m³
 - one story, 4-port habitat unit
 - cylindrical with vertically oriented axis
 - 5.0 meter [16.4 ft] inner diameter, 2.0 meter [6.6 ft] barrel height, and 0.65 meter [2.1 ft] end domes on top and bottom for total height of 3.3 meters [10.8 ft].
- Loft: 69.9 m³
- Airlock: 8.6 m³
- Hygiene Module: 14.1 m³
- Total Volume: 148.1 m³

Human research capability of HERA



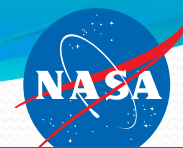
- Capability and potential for long duration (30+ days) human research
- Currently identified for research in
 - Behavioral Health and Performance
 - Test crew hierarchy, team cohesion and stress in an confined, isolated crewmembers
 - Remote communications with a delay
 - Simulate autonomous operations
 - Drives long duration requirement
 - Space Human Factors and Habitability
 - Controlled environmental conditions
 - Temperature
 - Humidity
 - Lighting
 - Exploration Medical Capability
 - Telemedicine operations

Human research application of HERA



- Facility can be used to test operational concepts
 - Transit phase
 - Isolation/Confinement within HERA
 - Exploration scenarios
 - Crew leaves HERA for simulated planetary EVAs
- Assume 4 missions per year for 2-3 years
- Just completed 4 missions, 7 day duration.
- Missions are tightly controlled in terms of stress, work pace, mission tasks and objectives.

HERA timeline/ MCC



Plan View to capture time horizon: 14d

Onboard Short Term Plan Viewer

HERA- MD2

AEM Graphos-1

OSTPV Onboard Short Term Plan Viewer

HERA- MD2

OSTPV Onboard Short Term Plan Viewer

GMT 115

Houston

05

06

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Commander

Flight Engineer

Mission Spec

Mission Spec

Sleep

Sleep

Sleep

Sleep

Post-Sleep Activities
Breakfast w/ FIT

Post-Sleep Activities
Breakfast w/ FIT

Post-Sleep Activities
Breakfast w/ FIT

Post-Sleep Activities
Breakfast w/ FIT

Prep

Prep

Prep

Prep

DPC

DPC

DPC

DPC

Medication

Medication

Medication

Medication

Flight Sim

Flight Sim

Exercise/Hygiene

Exercise/Hygiene

Exer

Exer

Crystal

Exer Mntr

Animal Bio

Exercise/Hygiene

Rover Assembly

Rover Assembly

Lunch w/ FIT

Lunch w/ FIT

SARA

SARA

Plant Biology

Micro-bio

Lunch w/ FIT

Lunch w/ FIT

Asteroid Base

Asteroid Base

Flight Sim

Flight Sim

Exercise/Hygiene

Exer

Family Conf

Exercise/Hygiene

SARA

SARA

DPC

DPC

Rover Assembly

Rover Assembly

DPC

DPC

Pre-Sleep Activities

Pre-Sleep Activities

Pre-Sleep Activities

Pre-Sleep Activities

Journal + Qs

Journal + Qs

Journal + Qs

Journal + Qs

Badge

Badge

Badge

Badge

Cognition

Cognition

Cognition

Cognition

AM Q

Asteroid Base

MSU Team Task

Badge

Cognition

Dose T

DPC

DPR

DR

EM Sim

EV SMP

Exer Mntr

FIT

Journal + Qs

L1/L2 Cleaning

Med Eval

PAO Event

Prep

PM Q

SARA

Sys Stat Chk

TEAM

TPT

Voice

Wt. Scale

AM Questionnaire

MSU Team Task

Badge-related task (remove/attach, upload data)

Cognition Test Battery

Dose Tracker

Daily Planning Conference (AM/PM)

Daily Plan Review (Comm. delay days only)

Daily Ratings

Emergency Simulator (Fire/Med/SPE)

Event/Time Contingent Sample

Exercise Monitor for other crewmember

Food Intake Tracker (Scheduled with every meal)

Journal + Questionnaires

Cleaning and Maintenance

Medical Evaluation

Photo/TV Educational Payload Opportunity

Daily Prep

PM Questionnaire

SARA Task

System Status Check

Team Cohesion Survey

Team Performance Task

Attach voice recorder

Post-Event Workload Scale

* Task may be listed, but may not be scheduled MD represented above

STORAGE LIST

DROP BOX

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